MATERIAL SAFETY DATA SHEET
For
BATTERY PACK

Lithium-Ion/Polymer rechargeable battery Pack

Customer: **HEIGHT TECHNOLOGIES**

REVISION TABLE

Rev.	Date
0	February 16, 2016
A	September 10, 2020

TABLE OF CONTENTS

1. SECTION 1 – PRODUCT AND MANUFACTURER INFORMATION

1.1. This document is a preliminary MATERIAL SAFETY DATA SHEET for a proto-type battery pack.

1.2. PRODUCT COMPANY: AMICELL - AMIT INDUSTRIES Ltd.

1.3. PRODUCTs P.N.: **901LP12374-6S1PM1**

1.4. PRODUCT DESCRIPTION: Li-Ion / Polymer rechargeable Battery Pack.

1.5. NOMINAL VOLTAGE/VOLTAGE: 22.2V

1.6. Wh rating: 399.6Wh

1.7. Basic cell: 104-ABLP8474170H300

1.8. HAZARD RATINGS:

	NPCA/HMIS	NFPA 704	Rating Key
Health:	0	0	0 = Minimal
Flammability:	0	0	1 = Slight
Reactivity:	0	0	2 = Moderate
			3 = Serious
			4 = Severe

NFPA = National Fire Protection Association
NPCA/HMIS = National Paint & Coatings Association/ **Hazardous Materials Identification System**

1.9. APPLICABLE DOCUMENTS:

1.9.1. AMICELL - AMIT INDUSTRIES – Data sheet DS12374-1268-18, rev.0, date: February 11, 2018.

1.9.2. AMICELL - AMIT INDUSTRIES – Test report COT12374-1867-20, Rev.0, September 10, 2020.

2. SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components

CAS-No.	Chemical name	Quantity
1307-96-6	Cobalt oxide	< 30 %
1313-13-9	Manganese dioxide	< 30 %
1313-99-1	Nickel oxide	< 30 %
7440-44-0	Carbon	< 30 %
	Electrolyte (*)	< 20 %
24937-79-9	Polyvinylidene fluoride (PVdF)	< 10 %
7429-90-5	Aluminium foil	2 - 10 %
7440-50-8	Copper foil	2 - 10 %
	Aluminium and inert materials	5 - 10 %

Full text of each relevant R phrase can be found in heading 16.

Further Information
For information purposes:
(*) Main ingredients: Lithium hexafluorophosphate, organic carbonates

Because of the cell structure the dangerous ingredients will not be available if used properly.
During charge process a lithium graphite intercalation phase is formed.

Mercury content:	Hg < 0.1mg/kg
Cadmium content:	Cd < 1mg/kg
Lead content:	Pb< 10mg/kg

3. SECTION 3 – HAZARDS IDENFICATION / EMERGENCY OVERVIEW

PRIMARY ROUTES OF ENTRY

Skin contact, Skin absorption, Eye contact, Inhalation, and Ingestion: NO

SYMPTOMS OF EXPOSURE

In case of battery damage, possible release of dangerous substances and flammable gas mixture.

Skin contact

No effect under routine handling and use.

Skin absorption

No effect under routine handling and use.

Eye contact

No effect under routine handling and use.

Inhalation

No effect under routine handling and use.

Ingestion

No effect under routine handling and use.

REPORTED AS CARCINOGEN

Not applicable

4. SECTION 4 – FIRST AID MEASURES

GENERAL

The following first aid measures are required only in case of exposure to interior battery components after damage or misuse. Undanaged, under routine handling and use – represente no danger to health.

Inhalation	If exposure to internal materials within the battery due to damaged outer casing, Leave area immediately. Make the victim blow his/her nose, gargle. Seek medical attention immidiatlty.
Ingestion	If swallowed, Drink plenty of milk/water and induce vomiting; Seek medical attention immediately.
Skin Contact	Remove contaminated clothes and shoes immediately. Immediately wash extraneous matter or contact region with soap and plenty of water. If irritation continoues seek medical attention.
Eye Contact	**Do not rub eyes.** Immediately flush eyes with water continuously, also under the eyelids, for **at least 15 minutes**. Seek medical attention.

5. SECTION 5 – FIRE FIGHTING MEASURES

GENERAL HAZARD

Cell is not flammable but internal organic material will burn if the cell is incinerated. Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

EXTINGUSHING MEDIA

Use extinguishing media suitable for the materials that are burning. Use metal fire wxtinction poweder or dry sand if only small amount of batteries are involved.

SPECIAL FIREFIGHTING INSTRUCTIONS

If possible, remove Battery/ies from fire fighting area. If heated above 125°C, Battery/ies can explode/vent.

SPECIAL HAZARDS ARISING FROM THE CHEMICAL

May form hydrofluoric acid if electrolyte comes in contact with water.

In case of fire, the formation of the following flue gases cannot be excluded: Hydrogen fluoride (HF), Carbon Monoxide and Carbon Dioxide.

FIREFIGHTING EQUIPMENT

Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

6. SECTION 6 – ACCIDENTAL RELEASE MEASURES

ON LAND

Place material into suitable containers and call local fire/police department.

IN WATER

If possible, remove from water and call local fire/police department.

7. SECTION 7 – HANDLING AND STORAGE

7.1. Handling:

No special protective clothing required for handling individual cells.

7.2. Storage:

Store in a cool & dry place.

Storage temperature: -20°C - +55°C

Best storage temperature: +15°C±5°C

7.3. Additional Safety Instructions for Handling and Storage

7.3.1. Do not short-circuit the Battery Pack. Do not connect the plus (“+”) and the minus (“-“) terminals with metal objects (such as wires).

7.3.2. Do not carry or store the Battery Pack with metal objects (such as wires, electrical items, etc.) and always transport or store it when the terminals are insulated.

7.3.3. Do not transport or store the battery near flammable liquids or gas: Prevent any contact between the Battery Pack and flammable liquids or gas.

7.3.4. Do not transport or store it in a location where static electricity is rich, otherwise, the safety devices may be damaged, causing a harmful situation.

7.3.5. Do not transport or store near Heated Place.

7.3.6. Do not immerse the Battery Pack in water or seawater, or get it wet.

7.3.7. Do not inflict structural loads on the Battery Pack.

7.3.8. Do not get into a microwave or a high-pressure container. It might cause the Battery Pack to generate smoke, rapture or flame, because of a sudden heat or damage in the sealing condition of the Pack.

7.3.9. Do not transport or store leaked battery.

7.3.10. Do not Do not transport or store an abnormal battery (Rust, Changing color and Deformation).

7.3.11. Do not drive sharp objects into the Battery Pack.

7.3.12. Do not Impact the Battery Pack or Drop it. Do not strike or throw the battery against rigid surface.

8. SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Keep away from heat and open flame. Store in a cool dry place.

PERSONAL PROTECTION

Respiratory protection	Not required during normal operations. SCBA required in the event of a fire. Respirator with air cylinder, dust mask.
Hand protection	Not required during normal operations. In abnormal event: Protective gloves.
Eye/Face protection	Not required beyond safety practices of employer. In abnormal event: Goggle or protective glasses designed to protect against liquid splashes.
Skin and body protection	Working clothes with long sleeve and long trousers. Steel-toed shoes recommended for large container handling.

9. SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

State	Solid
Odor	N/A
pH	N/A
Vapor Pressure	N/A
Vapor density	N/A
Boiling Point	N/A
Solubility in water	Insoluble
Specific Gravity	N/A
Density	N/A

10. SECTION 10 – STABILITY AND REACTIVITY

Stability	None is during normal operation.
Incompatibilities	None during normal operation. Avoid exposure to heat, open flame, and corrosives
Hazardous decomposition products	None during normal operating conditions. If cells are opened, hydrogen fluoride and carbon monoxide may be released.
Reactivity	None
Conditions to avoid	Avoid exposure to heat, open flame and corrosives. Do not puncture, crush or incinerate.

11. SECTION 11 – TOXICOLOGICAL INFORMATION

This product does not elicit toxicological properties during routine handling and use.

Sensitization	NO
Teratogenicity	NO
Reproductive toxicity	NO
Acute toxicity	NO

If the Battery is opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

12. SECTION 12 – ECOLOGICAL INFORMATION

Some materials within the cell are bioaccumulative. Under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.

13. SECTION 13 – DISPOSAL CONSIDERATIONS

Dispose of according to all federal, state, and local regulations.

14. SECTION 14 – TRANSPORTATION

Transportation Instructions:

- Class 9

UN. No.	3480	3481	3481
UN proper shipping name	Lithium Ion Batteries	Lithium Ion Batteries Packed with Equipment	Lithium Ion Batteries Contained in Equipment
Packing instruction		966	967
Section	Section IA	Section I	Section I
Quantity per package	-	-	-
Max net weight per package	35 Kg	PAX ≤ 5Kg CAO ≤ 35Kg	PAX ≤ 5Kg CAO ≤ 35Kg
Labels on outer package			
State of charge	≤30%	-	-

This product passed the applicable tests according to IATA UN Manual of Tests and Criteria, Part III, subsection 38.3. See applicable document 1.9.2.

15. SECTION 15 – REGULATORY

OSHA hazard communication standard (29 CFR 1910.1200).

16. SECTION 16 – OTHER INFORMATION

The recommendation and information contained in this MSDS have been compiled from sources believed to represent the most current information available when the MSDS was prepared. However, the manufacturer of this battery pack does not provide any warranty and/or guaranty as to the correctness or sufficiency of this information. If this product is to be used in large amount and/or an unusual manner, the user is obliged to determine what safety measures are appropriate, including the applicable and relevant workplace and environmental regulations pertaining to handling, use and disposal.